Management Plan

Berengrave Local Nature Reserve

January 2012 – December 2016

Compiled by Kent Wildlife Trust

Introduction

Kent Wildlife Trust has been commissioned to provide a five year management plan for Berengrave Local Nature Reserve, owned and managed by Medway Council with the assistance of the Friends of Berengrave.

Previous management plan

The site has benefited from a previous management plan; *Berengrave Local Nature Reserve Site Management Plan 2006-2011* Medway Council in Partnership with Friends of Berengrave.

This previous management plan provided a vision for the site alongside management aims. These are as follows:

Vision:
"Berengrave will be managed to enhance the habitats, flora and fauna, and to restore areas of historic significance. Management will foster public interest and ownership through improved access and continued consultation, allowing the development of recreation, interpretation and education".

In the previous management Green Flag award Criteria was used to help formulate the aims by which the Vision could be achieved.

These Aims are as follows:

- **Positively welcome visitors** to Berengrave, in terms of physical, intellectual and social access.
- Ensure a **healthy, safe and secure** experience for users.
- Provide a **well-maintained and clean** reserve.
- Improve the **environmental quality and sustainability** of practices carried out on the reserve.
- Maintain and develop the **ecological and conservation value** of the full range of wildlife habitats and heritage sites, whilst ensuring access and provision for users.
- Provide opportunities to further **increase community use and involvement** through events, education and interpretation.
- Ensure **effective promotion** of the reserve as an important wildlife and community resource.
- Ensure all those involved in the management and maintenance of Berengrave Nature reserve **effectively use the Management Plan** as a working document.

The original management plan has a Monitoring and review section. Any pertinent details from this process could be included within this management plan.

Description of the Site

Introduction:

This section describes what is already known about the site for which this management plan is being written. It discusses the significant features of the site, the habitats, species, history and cultural aspects that go together to make up why the site is important and should be managed.

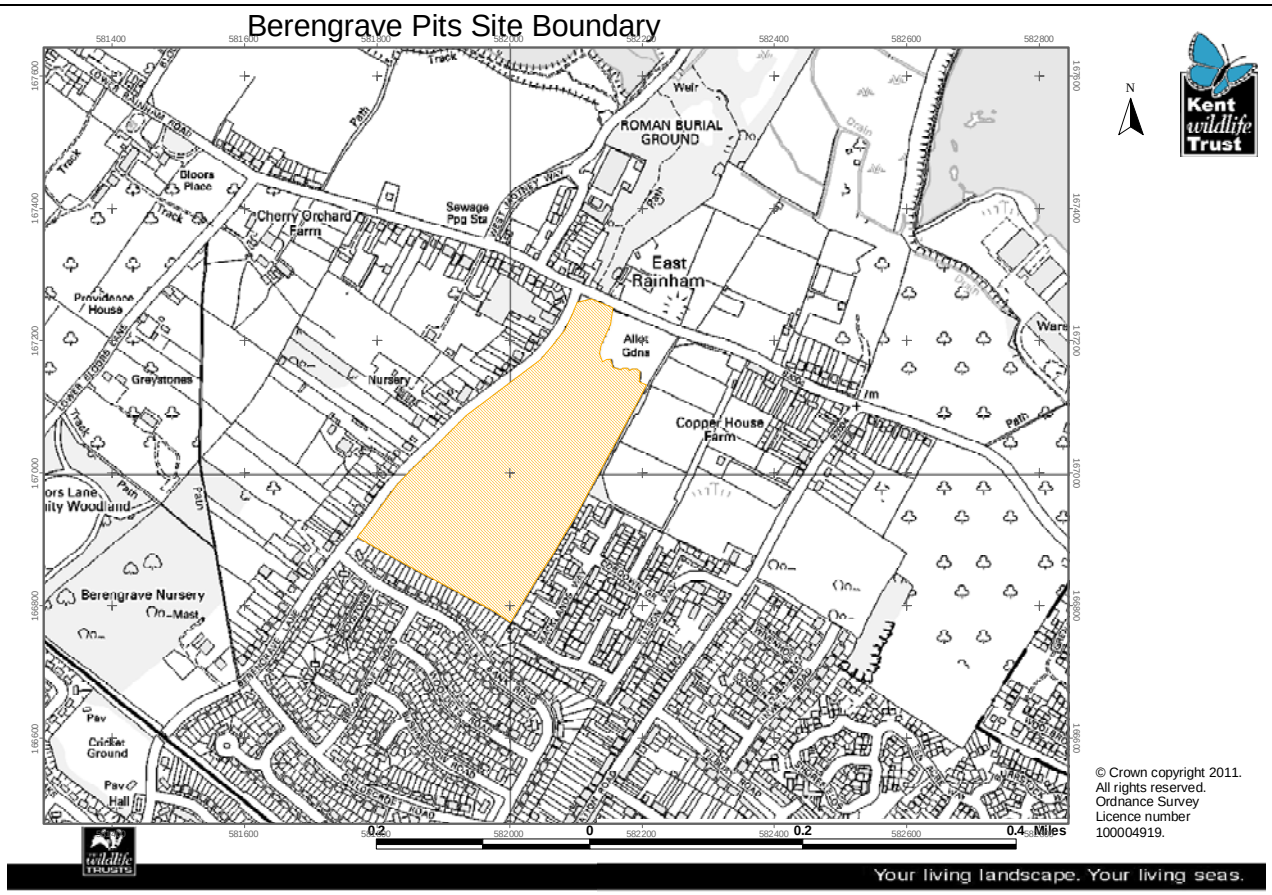
It makes reference to and explains the designations that are relevant to the site and its management. This section also tries to describe the site in terms of both its local and regional significance.

Where protected species have been recorded or are likely to be on site it explains the relevant legislation that must be considered before managing the site.

Location:

Berengrave LNR forms part of the Riverside Country Park. The reserve is situated approximately half a mile South East of Lower Rainham and approximately half a mile North of Rainham station in the parish of Rainham in the county of Kent. The site covers approximately 9.46 ha. OS reference 820670. The LPA is Medway Council.

Bartlett Creek (part of the River Medway) runs 1.3 miles to the North and the Chatham to Newington railway line lies to the South and South-West.
Berengrave Lane runs along the North-Eastern boundary and the B2004 runs along the very tip of the Northern boundary. The Southern and Eastern boundaries mainly lie alongside the residential areas of Rainham.



Map 1: Location and site boundary of Berengrave LNR.

Access and Public Rights of Way:

There are no public rights of way allowing access to the site. However, the site is open to the public through permissive rights of way. These are public highways which are legally protected in the same way as roads.

Land Tenure:

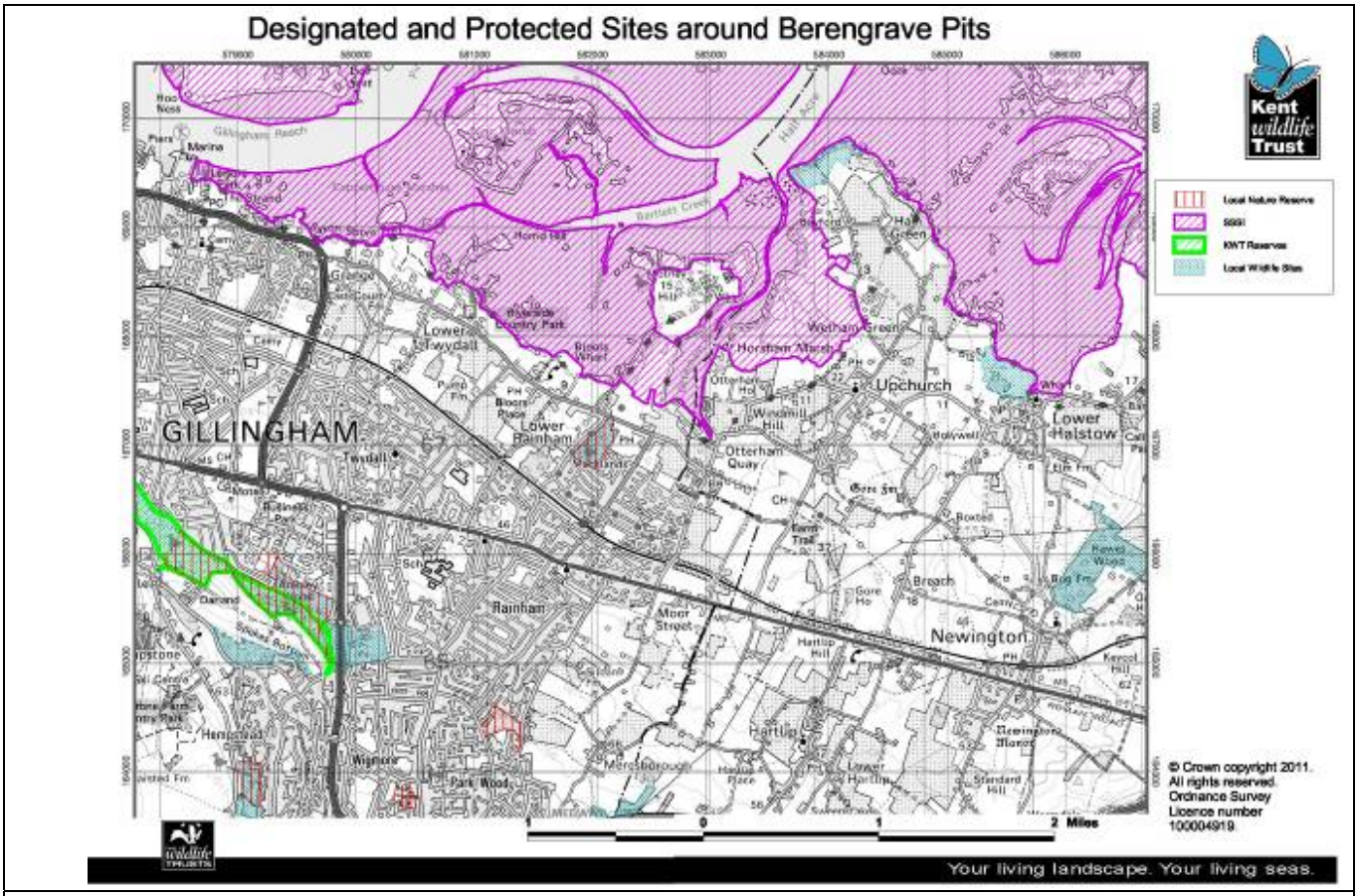
The site is owned by Medway Council as part of the Riverside Country Park.

Site Status:

Berengrave was designated a Local Nature Reserve in 1984 and is also a Local Wildlife Site. The Riverside Country Park is a Ramsar site, Site of Special Scientific Interest and a Special Protection Area. There are two RSPB reserves within the park; Motney Hill Marshes and Nor Marsh. The park also has a Green Flag Award and is a part of the North Kent Marshes Biodiversity Opportunity Area.

There are several LNRs nearby; Ambley Wood, Fox Burrow Wood and South Wood, and several Ancient woodlands; Ambley Wood, Grove Wood, East Hoath Wood, Fox Burrow Wood, South Wood, Farthing Wood, Yaugher Woods, Potters Wood and Hawes Wood. There are also two Wildlife Trust Reserves; Darland Banks and Queendown Warren.

Additionally the nearby A278 is a Roadside Nature Reserve. Berengrave LNR therefore forms part of a mosaic of important protected sites for the benefit of wildlife and contributes to the biodiversity value of the area.



Map 2: Designated and protected sites present around Berengrave Pit highlighting its status as a LNR and Local Wildlife Site and its proximity to a SSSI.

Local Nature Reserves

Local Nature Reserves are designated by local authorities. The designation of a Local Nature Reserve is made under section 21 of the National Parks and Access to the Countryside Act 1949.

Natural England provides both advice and guidance on the establishment of Local Nature Reserves. Further details are available from their website; www.naturalengland.org.uk

Local Wildlife Sites

Local Wildlife Sites (LWS) are areas which are important for the conservation of wildlife. They may support threatened habitats, such as chalk grassland or ancient woodland, or may be important for the wild plants or animals which are present within them. In Kent, there are over 440 Local Wildlife Sites. LWS are not the same as Sites of

Special Scientific Interest (SSSIs), described below, as they have no statutory protection and are important at the county rather than the national level.

LWS are important as they help to protect wildlife locally and recognise the importance of protecting features and sites that exist outside the network of statutorily protected areas. Although LWS are not afforded legal protection local planning authorities are still required to consider the impact of development upon them and the wildlife within them. Local Wildlife Sites therefore fill an important gap not covered by other designations.

In Kent, the Local Wildlife Site system is maintained by the Kent Biodiversity Partnership (KBP). Kent Wildlife Trust manages the system of behalf of the Partnership. The current system of identification of sites is recognised and supported by English Nature, the Environment Agency, Kent County Council, Medway Unitary Authority, and the various district councils.

Physical Features:

The area is a disused chalk pit composed of Cretaceous chalk on the dip slope of the North Downs. The chalk was deposited in the Cretaceous geological period 144-65 million years ago. Chalk is a white limestone rock formed in warm marine conditions. It is made from calcium a component of the skeletons of tiny marine creatures.

Chalk has been quarried in Kent for a variety of purposes. On this particular site the chalk was used in the manufacture of cement. The previous management provides an interesting although un-referenced account

"Between 1901 and 1912, the chalk from Rainham Chalk Pit was shipped by barge from Rainham Dock (to the North of Berengrave) to local cement works on the River Medway. Chalk from Rainham Chalk Pit was used in the manufacture of cement that was used, among other things, in the building of the rapidly expanding London suburbs of the early 1900,s and the reconstruction of San Francisco following the great earthquake of 1906." *Berengrave Local Nature Reserve Site Management Plan 2006-2011* Medway Council in Partnership with Friends of Berengrave.

Biological Features:

Berengrave LNR is part of the Riverside Country Park habitat mosaic, which includes; intensive grassland, freshwater, coastal, woodland and neutral grassland habitats. There are a variety of habitats within the reserve itself, including reed beds, grassland, woodlands, ponds and a freshwater lake. The North Kent Marshes BOA is important for a variety of species and Berengrave LNR provides ideal habitats for many of these, including several BAP species such as reed bunting and water vole.

Surveys by Medway Council have identified 426 species of flora and 625 species of fauna. Berengrave LNR also supports populations of woodland and freshwater birds with 112 bird species sighted in Berengrave LNR and Rainham Dock (part of the River Medway, which has an International reputation as a site for migratory sea birds.).

KWT records contain a variety of surveys conducted at Berengrave LNR, which highlight the ability of the site to support a diverse collection of flora and fauna.
A survey conducted by L. Clemons in 2001 found over 240 species of Diptera including several nationally scarce or rare species.

"These include the hover-flies *Leucozona glaucia, Volucella* inanis *and Volucella* zonaria, the cranefly *Dicranomyia danica*, the grass-flies *Elachiptera rufifrons* and *Thaumatomyia rufa* and the fungus-gnat *Allodia triangularis*. Other rarities include the beetles *Demetrias imperialis* and *Dasytes puncticollis,* the solitary bee *Hylaeus cornutus* and the solitary wasps *Crossocerus distinguendus* and *Psenulus schencki*."

A 1984 species list, originally conducted by J. Williams and which has since been updated, indicates the total species numbers present at Berengrave Local Nature Reserve.

Fauna:

- Birds – 80 including
- Mammals – 14
- Fish – 7
- Reptiles and amphibians – 8
- Butterflies – 24
- Dragonflies – 11
- Moths – 122 macro and 47 micro
- Terrestrial snails – 17
- Aquatic snails – 7
- Bivalvia – 1
- Trichoptera - 4
- Hemiptera (true bugs) – 27
- Coleoptera – 28
- Ephemeroptera - 1
- Orthoptera – 7
- Hymenopetra – 15
- Dermaptera – 1
- Neuroptera - 2
- Diptera – 168
- Hydracarina – 1
- Crustacea – 4
- Tricladida – 2
- Hirudines – 2
- Collembola - 1
- Arachnida - 7

Flora:

- Trees and shrubs – 50
- Sedges and rushes – 13
- Grasses – 21
- Ferns – 4
- Mosses – 26
- Fungi – 83
- Liverworts – 2
- Lichens – 28
- Terrestrial algae – 1
- Aquatic algae – 10
- Horsetails – 1
- Other flowering plants (excluding grasses, sedges and rushes) – 168

This survey has identified an increase in species numbers within the majority of each category in comparison to an earlier 1982 survey by Gillingham Borough Council. This suggests the biodiversity of the area is continuing to increase. The 1982 survey also identified 5 fish species.

The species lists should be considered with regard to their age and the changes to the reserve in subsequent years. With the most recent being conducted by L. Clemons in 2001 succession by dominant species and high water levels years may have significantly altered the species composition.

Cultural features:

Archaeological research is conducted by the Friends of Berengrave, with washmills, wells and tunnels from the sites use as a chalk pit present on the site. There is also evidence of Stone Age activity at Rainham Dock East.

Photograph 1: Physical evidence of the sites former use as a chalk pit is still present.

Land Use History:

Berengrave LNR was the site of an orchard during the 19th century and a working chalk pit from the beginning of the 20th century until 1931. It was bought by Gillingham Borough Council in 1962, for the intention of using the site for landfill.
However, after a survey of the flora and fauna was conducted it was designated as a LNR on the advice of KWT.

In 2001 the site was closed due to foot and mouth risks. The site remained closed due to severe flooding and a consequent lack of management led to vegetation encroachment inhibiting access. Work on the reserve between 2003 and 2006, including the SusTrans Route 1 and the installation of new steps and boardwalks, allowed the site to be reopened in April 2006.

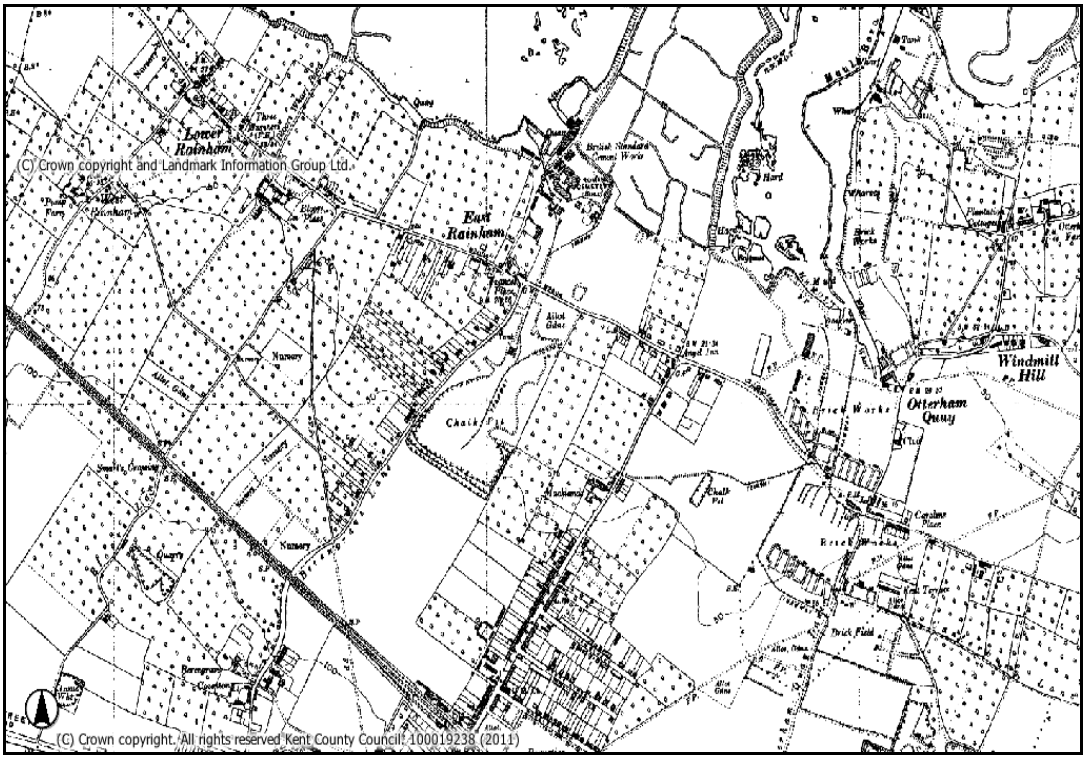

(C) Crown copyright and Landmark Information Group Ltd.
Lower Rainham
East Rainham
Windmill Hill
Otterham Quay
(C) Crown copyright. All rights reserved Kent County Council 100019238 (2011)

Figure 7. OS Landmark Edition 4 (1929-1952). This illustrates that historically much of the site was open and most likely to have been grassland or orchards. Kent Landscape Information System (KLIS).

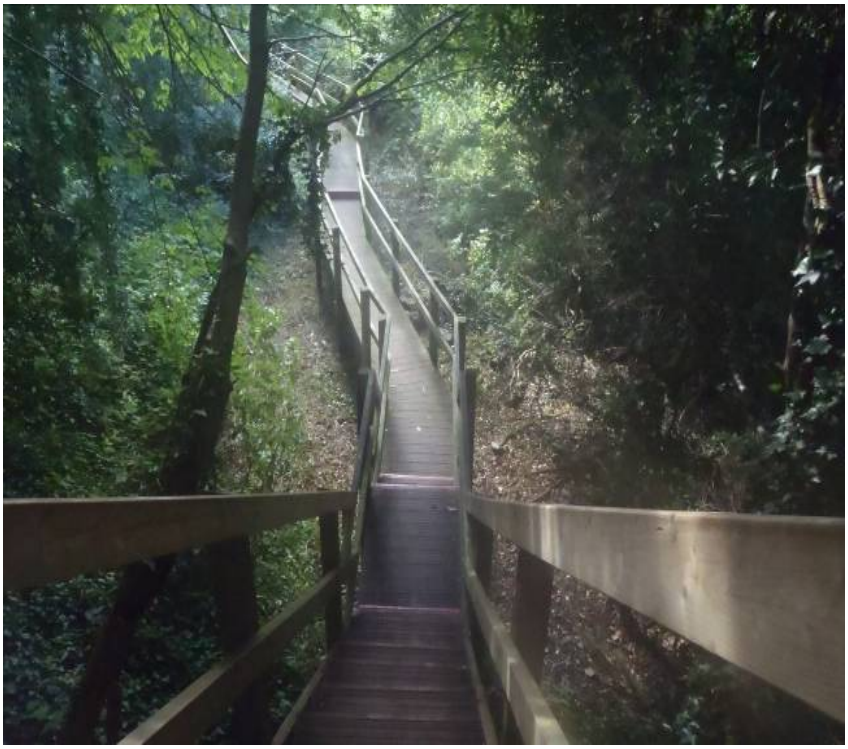
Socio-Economic Use:

The Friends of Berengrave formed between 2003 and 2005. The group has four main objectives:

- Work with Medway Council to conserve and enhance the existing biodiversity.
- Encourage public interest in, and legitimate use of, the site.
- Promote the use of the site for educational and scientific purposes
- Research the history of the site and maintain and publish this historical information for public benefit (www.friendsofberengrave.btck.co.uk).

Access and Visitor Facilities:

There are permissive access routes throughout the reserve with steps and boardwalks installed in areas prone to flooding on the eastern side. Tree roots and flooding potentially limit access within the park. Steps and uneven paths may restrict concessionary access in some areas.



Photograph2: Steps and boardwalks allow access to otherwise inaccessible areas.

There is a viewpoint in the south-west corner and an enclosed picnic area in the North. There are three main entrances, each with information, signage and safety information. There are also information boards to allow self-guided walks.

Map 3: Access to Berengrave Pit and the main features of the site.

SusTrans route 1 lies along the Western border allowing links to other cycle routes. Rainham Station is approximately half a mile south of the reserve and there are bus routes along the B2004. It is possible to park cars along lay-bys on Lower Rainham Road (B2004) and Berengrave Lane. There is also a Car park on the western side of Motney Hill Road and on-street parking is available along Chalky Bank Road. Car parking spaces are limited and group visits require drop-off and pick-up arrangements.

Description of Local Wildlife Site from Site Citation ME19

Berengrave Local Nature Reserve, Kent Wildlife Trust

The Site was first notified as a Local Wildlife Site in 1987. The citation was revised in January 2004

This site is important for a range of habitat types associated with former chalk quarries, including ponds, fen and scrub, which support a number of nationally rare and scarce species.

Since working ceased in this chalk pit in the 1930s, it has become colonised to produce a variety of habitats. These include scrub and developing woodland, marshy areas with sallow as well as ponds and rough grassland dominated by tall herbs associated with disturbance. The pit has a high perimeter, with a system of terraced paths leading down to a damp woodland floor.

Despite flooding in recent years and increasing colonisation by trees and shrubs, the floor of the quarry still supports lily of the valley *Convallaria majalis*, adder's-tongue *Ophioglossum vulgatum* and common-spotted orchid *Dactylorhiza fuchsii*. Common fleabane *Pulicaria dysenterica*, grey willow *Salix cinerea*, hart's-tongue *Phyllitis scolopendrium*, male-fern *Dryopteris filix-mas*, common twayblade *Listera ovata*, columbine *Aquilegia vulgaris* and hemp-agrimony *Eupatorium cannabinum* are among other species recorded.

The large pond, which once covered more than half of the quarry floor, now has a reduced area of open water, having been heavily colonised by sallow. The sallow is of interest for common lichens and, to a limited degree, for birds, but has changed the balance of habitats present. Marginal species present include lesser pond-sedge *Carex acutiformis*, lesser water-parsnip *Berula erecta*, water figwort *Scrophularia auriculata* and yellow iris *Iris pseudacorus*. Birds recorded from the site include song thrush, reed warbler, little grebe, starling, swallow, dunnock and a variety of tits and warblers. Great crested newt, grass snake, frog and toad have all been recorded previously.

This is an important site for diptera, with more than 240 species having been recorded previously, including several nationally scarce or rare species.

This is an important urban site, regularly used for educational purposes and managed as a Local Nature Reserve by the local authority. A planned management programme will enhance the wildlife value of the site for the benefit of wildlife and the local community.

Habitats Within the Local Wildlife Site:

Chalk Quarries:

There are four main habitat types associated with disused chalk pits; lowland calcareous grassland, open chalk habitats, scrub and ponds. A mosaic of successional stages is able to occur with variations in slope, aspect and climate allowing for an abundance of niches. This means that, with appropriate management, disused chalk pits have the potential to support a maximum diversity of flora and therefore fauna.

Lowland Calcareous Grassland:

Lowland calcareous grassland is a BAP Priority habitat. The Kent Biodiversity Action Plan currently includes a target to protect as Wildlife Sites all unimproved chalk grassland sites over 2ha in extent, to halt further fragmentation. Calcareous grassland is also important at a European level as illustrated by its inclusion in the EC Habitats Directive 92/43/EEC as being of Community interest. This habitat can support a variety of species including several invertebrate BAP Priority species such as the hazel pot beetle, silver spotted skipper butterfly, Adonis blue butterfly, the wart-biter grasshopper, the phantom hoverfly and several moths including the bordered gothic, pale shining brown and four spotted. Many nationally rare and scarce floral species are also associated with this habitat including burnt tip orchid, early spider orchid, pyramidal orchid, spotted cat's-ear, purple-stemmed catstail, purple milk-vetch, dwarf sedge and pasqueflower. Twenty percent of the south-east chalk grassland resource occurs in Kent. Of this, a third is notified as Sites of Special Scientific Interest (SSSI), and a further third lies within Local Wildlife Sites (Kent BAP Partnership, 2011).

The cover of lowland calcareous grassland has declined sharply over the last 50 years, with the current cover estimated at 33,000 to 41,000 ha. The UK BAP identifies fragmentation and reduction in size of sites as being a key factor negatively affecting this habitat. However, much recent loss is due to neglect. Removal of grazing from chalk grassland results in changes in the sward, which may be difficult to reverse, and eventually to encroachment by scrub. Effective management of calcareous grassland is important as most of these species fail to persist in the seed bank, so that restoration of a badly degraded site may be a very long term process.

Open Chalk Habitats:

The ecological conditions provided by chalk pits provide unique niches. The thin soils hold low levels of nutrients, little water and heat up quickly, which provides the stressed conditions needed to prevent domination by taller competitive grasses. Further, rabbits and grazing animals provide disturbance on the chalk faces which ensures the early stages of succession are maintained. Pioneer species and species dependant on bare ground or an absence of competition thrive under these conditions. Additionally, open areas reach high temperatures in summer and support species limited to southern

England. Species can include: winter-cress, bee orchid, hairy rock-cress, knotted hedge parsley, red hemp nettle, military orchid, and the chalk carpet moth.

Trees and Scrub:

In areas where disturbance is reduced, scrub is able to become established as a seral stage where the vegetation is moving towards the climax community. In other words scrub can be found in grassland habitats where lack of management such as grazing is allowing scrub to develop as a stage in the eventual transition of a site to woodland. Scrub is also found as the climax vegetation stage where environmental factors limit the development of other habitats. Scrub can also be found (e.g. willow and other salix species) in aquatic habitats such as ponds and fens as they silt up or dry out. Scrub is often defined as shrubs and tree saplings usually less than 5 m tall. The presence of scrub can enhance other communities or habitats such as grassland and fen.

Scrub can be species rich and able to support communities of lichens and mosses, as well as providing nesting sites for birds and habitats suitable for invertebrate and mammal populations. Further, chalk heath and acidic grassland are able to become established where thicker soils develop and soil conditions remain acidic. Both these habitat types are rare and therefore important for the species they support. The structural diversity provided by scrub may add to the biodiversity interest of chalk grassland sites.

The scrub which generally develops on chalk grassland sites is typically species-rich in itself. Species-rich scrub is of nature conservation interest in its own right, providing habitat and pollen sources for a range of insect species. It also provides cover for herpetofauna (the grass/scrub interface provides important basking habitat for lizards and snakes), and protects grazing-intolerant species (such as man orchid) from grazing animals. It also provides feeding and foraging opportunities for birds.

The structure of scrub can vary from almost open habitat to closed canopy. The structure of the scrub habitat directly influences the species that are supported. The interaction between different species and scrub can be complex. Generally speaking scrub should be managed on a rotation to provide the greatest range of habitats as possible.

Management should occur during the autumn and winter and not the spring to avoid disturbance to breeding birds. Breeding birds are protected under the Wildlife and Countryside Act 1981 (as amended) which makes it illegal to intentionally kill, injure or take any wildlife bird, and to take, damage or destroy the nest (whilst being built or in use) or eggs.

Ponds and Fen:

The Kent BAP includes a target to retain the current area of standing open water in Kent as well as a target to maintain existing areas of reed bed, a habitat type which is found at Berengrave LNR. Species typical of ponds within disused chalk pits include valerian, marsh marigold, long-stalked yellow sedge, flea sedge, various calcicolous mosses and great crested newt.

Table 1. Notable species recorded from Local Wildlife Site

Notable species included are those which are of conservation concern, protected by legislation or are a UK BAP species.

Common Name	Latin Name	Status
Vascular Plants		
Adder's tongue fern	Ophioglossum vulgatum	County Scarce. Atlas of Kent Flora. Philp. 1982
Lily of the valley	Convallaria majalis	County Scarce. Atlas of Kent Flora. Philp. 1982
Grey willow	Salix cinerea	County Scarce. Atlas of Kent Flora. Philp. 1982
Invertebrates		
Small Heath butterfly	*Coenonympha pamphilus*	Priority Species, UK Biodiversity Action Plan
Wall Butterfly	*Lasiommata megera*	Priority Species, UK Biodiversity Action Plan
Reptiles and Amphibians		
Great crested newt	*Tritusus cristatus*	Priority Species, UK Biodiversity Action Plan 1998 This species is protected under all elements of Section 9 of the Wildlife and Countryside Act 1981. They are also protected under parts 1 and 2 of Regulation 39 of the Habitats Regulations 1994 and the Countryside and Rights of Way Act 2000. This legislation taken together prohibits the following on any of these species: Deliberately, intentionally or recklessly, injuring, killing and capturing; Deliberately, intentionally or recklessly disturbing; Deliberately, intentionally or recklessly taking or destroying eggs;

		Deliberately, intentionally or recklessly destroying a breeding site or resting place or damaging or obstructing a resting place used for shelter or protection; Keeping, transporting, selling or exchanging; offering for sale or advertising. Consequently not only are the animals themselves protected, but so is their habitat, and activities that damage or impede the use of this habitat are prohibited
Grass Snake	Natrix natrix	Protected under Wildlife & Countryside Act 1981 Priority Species, UK Biodiversity Action Plan Partially protected under the 1981 Wildlife and Countryside Act. It is illegal to intentionally kill or injure these animals
Slow-worm	*Anguis fragilis*	Priority Species, UK Biodiversity Action Plan Partially protected under the 1981 Wildlife and Countryside Act. It is illegal to intentionally kill or injure these animals
Birds		
Tree Pipit	*Anthus trivialis*	Priority Species, UK Biodiversity Action Plan
Lapwing	*Vanellus vanellus*	Priority Species, UK Biodiversity Action Plan
Song Thrush	*Turdus philemolos*	Priority Species, UK Biodiversity Action Plan 1998 Red List. Birds of Conservation Concern 2002-2007 Kent Red Data Book Status 2. A. Waite (Ed) 2000 Rapid Decline. BTO Breeding Birds Report 2000
Reed Bunting	*Emberiza schoeniclus*	Priority Species, UK Biodiversity Action Plan
Reed Warbler	*Acrocephalus scirpaceus*	Kent Red Data Book Status 3. A. Waite (Ed) 2000

Starling	*Sturnus vulgaris*	Red List. Birds of Conservation Concern 2002-2007 Rapid Decline. BTO Breeding Birds Report 2000
Mammals		
Water Vole	*Arvicola terrestris*	Priority Species, UK Biodiversity Action Plan From the 6th April 2008 water voles became subject to increased legal protection and are now fully covered by the provisions of Section 9 of the Wildlife and Countryside Act 1981 (as amended). Legal protection makes it an offence to: • Intentionally kill, injure or take water voles • Possess or control live or dead water voles or derivatives • Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection • Intentionally or recklessly disturb water voles whilst occupying a structure or place used for that purpose • Sell water voles or offer or expose for sale or transport for sale • Publish or cause to be published any advertisement which conveys the buying or selling of water voles.
Hedgehog	Erinaceus europaeus	Priority Species, UK Biodiversity Action Plan

Management Plan

The significance of the habitats within the Local Wildlife Site and the contribution of the site to both regional and local biodiversity have been discussed. This section describes the site and its features following a site visit. The features, their significance and management are then discussed. A series of recommendations follow. From these a number of objectives are derived. Projects are then suggested to implement the objectives. These are then prioritised into a five year management plan.

Field Survey Visit / Results

This site is important for a range of habitat types associated with former chalk quarries, within four habitat compartments; grassland, ponds, fen and trees/scrub, first notified in 1987. A recent site visit found the site to be dominated with mixed broadleaved woodland around the boundary and scrub dominant throughout the pit with only a small area of open grassland present. The area of the pond has been considerably reduced by the presence of sallow. There are also open chalk habitats present at the site.

The woodland consists of occasional ash, frequent sycamore, frequent elder and hawthorn, occasional cherry and holm oak with very occasional yew. Ivy and bramble are also frequent with Ivy occasionally dominant.

It is highly likely that Berengrave Pit previously had a cover of calcareous grassland and orchards with some scrub present. Calcareous grassland is a species rich habitat that needs to be actively managed to stop encroachment by scrub.

However since the sites industrial use those habitats have been lost and the topography permanently altered dramatically changing the sites future potential. In such a way the mosaic of habitats currently present have been able to establish and develop.

As discussed, scrub is a valuable habitat provided a balance is maintained as to its structure and species composition. As a seral habitat the eventual climax vegetation community would be woodland. Whilst woodland is a very important and valuable habitat it is unlikely that any closed canopy type woodland would in this instance have a greater biodiversity interest than the existing habitats. Much of the value of woodland is derived from it's continuity of habitat over hundreds, if not thousands of years together with the interaction of people in managing the woodland which maintains a diversity of habitat structure, in which wildlife can flourish. Often it is the edge of woodland that supports the most species diversity and in many ways scrub replicates the features of the woodland edge. Again a well managed grass scrub habitat matrix can have similar benefits to woodland rides and glades providing a range of habitat types structure and species to provide increasing opportunities in terms of food, nectar sources, roosting and basking opportunities. Often well managed scrub grassland habitat matrixes can be more sheltered providing greater warmth and humidity valuable for many invertebrate species, as well as reptiles and amphibians.

Scrub can also be a very important feature of wetland habitats for similar reasons. Again increasing structural diversity potentially supports a greater number of species but the benefits of the scrub habitat have to be balanced with the disadvantages. For both grassland and aquatic areas this can be the encroachment and changes to the original habitat and effects such as shading. Sallow has encroached on the pond and fen habitats and also requires control to

maximise biodiversity at the site and to ensure a variety of habitats are maintained for the benefit of wildlife and people.

The woodland area around the top of the pit is well established and, as previously mentioned, adds additional habitat and structural diversity. The frequent sycamore leads to a densely shaded woodland which is unlikely to support many woodland floor plant species although mosses, lichens and ferns may find the habitat suitable. Sycamore is a non-native naturalised tree, a native of central and southern Europe. There has been considerable debate about its influence in English woodlands. Sycamore seedlings find it very hard to germinate under closed canopy conditions. In effect mature sycamore suppresses new saplings from appearing. In cleared areas new saplings can rapidly colonise. Sycamore is now recognised as having some wildlife value.

The wet woodland at the heart of the site also provides an important habitat and is an example of what would have at one time been a far more common site in Britain. Pressures on land use and agricultural production have meant the loss of wet woodlands and as such they feature on Local Biodiversity Action Plans. The predominance of willow is also extremely valuable as they support a richer assemblage of insect life than any other tree species except oak. This in tern attracts a good number of bird species to feed on the food available. It is therefore important to retain such areas of carr or wet woodland.

Open water. In former quarries, following cessation of working and probably the pumping of water from the quarry, open water in the form of pond or ponds would have been one of the first habitats to start attracting wildlife.

In this instance some of the ponds on the site are thought to be the following:

"The washmill ponds are relics from when the site was a working chalk pit. Chalk from the pit had to be broken up in the washmills to remove the flint. It could then be baked with clay to produce cement. The washmills now provide a home for frogs, toads and newts, which visit in the spring to lay eggs."

Photograph 3: Remains of the washmill ponds.

Photograph 4: The washmill ponds have a varied flora of, for example, sedges and are likely to be valuable habitats especially for invertebrates.

Photograph 5: Willow scrub is now dominating many of the former open water areas.

The value of ponds for biodiversity is not necessarily a function of the depth of water. Shallow ponds and even ones that dry out completely can be very valuable for wildlife. The draw down zone, that is to say the area between the highest winter water level and the lowest summer level, can be particularly important as many plants and invertebrates need areas of mud and non-aquatic habitat during the year.

Scrub, especially willow scrub, is also a highly valuable habitat in association with open water. Willow is known to support a very high number of species on its own and this value can increase where it provides additional structure and habitat at the water's edge.

As Willow coppices very well and grows fast it can be easily managed in this type of habitat.

Of particular importance is the need to maintain the pond edge type habitats where there is a transition between the aquatic and terrestrial habitat. Marginal and emergent vegetation needs to be encouraged.

It would be recommended that the approximate area of the original pond be determined and then areas for open water, fen/marginal habitat and willow scrub be agreed.

Invasive Species

It was noted on the site visit that the invasive species Parrots feather *myriophyllum aquaticum* was possibly present in the pond. This is an alien invasive species than can rapidly colonise aquatic habitats displacing native species. The presence or absence of this species should be confirmed.

Recommendations

Following the desktop study and site visits the following management recommendations can be made.

The area of scrub should be reduced and maintained to no more than 60% of the site. The remaining scrub should be managed on a rotation of between 10 and 15 years to retain its structural diversity.

The maintenance and creation of glades within the woodland and scrub should continue to help support an increased biodiversity. Once glades have been established continued cutting with either a ricrocating bar mower or a disc mower should continue on a regular basis. All arisings should be removed.

The remaining scrub and woodland should be treated as coppice. Each year an area should be cut roughly equating to one twentieth for the next five years. This should re-establish the structural diversity. The scrub should then be cut on a regular 7-15 year cycle. There is a constraint to this recommendation in that the disposal of the cut material may be a problem on a small site such as this. It might be necessary to consider a designated bonfire site (a licence may be required) or to consider if a chipper can be brought to site and the chippings used elsewhere).

The cut areas are likely to go through a number of seral stages from open grassland, rank, tall grassland herb community scrub and bramble and the scrub. This is to be encouraged and welcomed. In some instances more frequent cutting might be considered to maintain one or other of these temporary habitats.

A balance between open water and willow scrub needs to be maintained with regular coppicing and occasional removal of willow scrub.

A methodology to determine whether this can be achieved needs to be considered. It would usually be recommended that the removal of scrub, other vegetation and silt be done by a machine for example a hymac. Limited access might make this impractical. The disposal of the arisings might also be problematic as there are limited opportunities on site. Clearance/disturbance should only be done in the autumn and winter and the guidelines as to the disturbance of Great crested newts should be consulted. Site managers should be satisfied as to whether or not any proposed work and methodology does or does not require a licence from Natural England.

Areas of fen and marginal habitat should be encouraged and managed.

Again this can be achieved either with machine or by regular cutting using brushcutters, rakes and chromes. Again there is a question as to how to dispose of the arisings.

The smaller washmill ponds should be occasionally managed to maintain the semi-aquatic vegetation. Low level pond clearances should be considered to remove silt and some of the vegetation.

This should only be done after the potential presence of protected species such as Great crested newts has been considered.

The woodland fringe should be retained and if possible opportunities to introduce more structural diversity considered. The potential of the woodland to support bats especially and possible other protected species should be considered. Any works should follow best practice guidelines and the potential need for licences considered.

http://www.forestry.gov.uk/forestry/infd-75tju5

The site should be managed to benefit the local community and visitors to the site in order to meet its designation as a local wildlife site, local nature reserve and its inclusion within the Riverside Country Park. Berengrave LNR is also important for the Friends of Berengrave, who regularly use the site. Therefore, management should include these considerations.

Management Aims

The purpose of this management plan is to maintain and enhance the habitat at Berengrave Pit local Nature Reserve, particularly those for which it has been designated a Local wildlife site,

ensuring its continuing value for biodiversity and individual species. In achieving this there is the potential to contribute to the wider living landscape by complimenting and supporting other important and designated habitats. In achieving these objectives the opportunity is provided for people to access semi natural habitats, areas of historical and cultural interest and to promote, through such activities, increased wellbeing.

Management Objectives

1. Restore and maintain areas of open water.

2. Maintain areas of fringe, reed, fen and scrub habitats around areas of open water.

3. Create and maintain diversity within scrub habitats for many species and maintain the habitat in so far as it contributes to other habitats.

4. Maintain small areas of woodland where it contributes to the biodiversity of other habitats.

5. Maintain open chalk surface especially where they might enhance lower plants or provide habitat for faunal species.

6. Retain naturally and manufactured features that are culturally and historically relevant.

7. Provide and maintain safe and readily accessible areas for visitors.

8. Provide and maintain interpretation material for a range of age groups and actual and potential users.

9. Provide opportunities for local residents to interact with and enhance their local environment for their and its benefit and enhancement.

These objectives could be achieved through the following projects which aim to meet the objectives over a five year period.

Management Objective	Project Details	Year				
		1	2	3	4	5
Restore and maintain areas of open water.	Identify areas of potential restoration	X				
	If practical restore 1/3 potential open water		X			
	If practical restore 1/3 potential open water			X		
	If practical restore 1/3 potential open water				X	
Maintain areas of fringe, reed, fen and scrub habitats around areas of open water.	Manage willow scrub by coppicing once it reaches 5m in height.	X	X	X	X	X
	Cut 1/3 fen and marginal vegetation every 3 years or when willow scrub starting to establish.	X			X	
Recognise the value of scrub habitats for many species and maintain the habitat in so far as it contributes to other habitats.	Implement rotational coppicing of scrub to maintain range of structure.	X	X	X	X	X
Maintain small areas of woodland where it contributes to the biodiversity.	Implement regular tree safety checks.	X	X	X	X	X
	Where necessary or desirable consider felling occasional sycamore or other species to create opportunities for more diverse canopy structure.	X	X	X	X	X
	Maintain paths through woodland if necessary.	X	X	X	X	X
Monitor open chalk surface especially where it may enhance lower plants or provide habitats for faunal species.		X	X	X	X	X
Monitor retain naturally and manufactured features that are culturally and historically relevant.		X	X	X	X	X
Provide and maintain safe and readily accessible areas for visitors.	Regularly inspect paths, boardwalk and other features to ensure their maintenance.	X	X	X	X	X
Provide and maintain interpretation material for a range of age groups and actual and potential users.	Review existing interpretation and make sure it is up to date and providing relevant information to visitors including management works.	X	X	X	X	X
Provide opportunities for local residents to interact with and enhance their local environment for their and its benefit.	Organise regular tasks and events, maintain regular newsletters, e-mails, website etc.	X	X	X	X	X